

XI.—On *Argulus dactylopteri*, a new Marine Argulid from the West Indies. By T. THORELL*.

As a supplement to my paper on the Crustacean family of the *Argulidae*†, I submit the following description of a new species of that family, which has been kindly communicated to me by Professor S. Lovén, together with the information that it was found in the gill-cavity of a *Dactylopterus volitans* (Linn.) from the West Indies.

The number of Argulids which live exclusively in the sea has hitherto been limited, as far as we know for certain, to two species, viz. *Argulus purpureus* (Risso) and *Argulus giganteus*, Lucas, both from the Mediterranean, of which, moreover, only the first-named species is known with any completeness. Consequently the discovery of a new marine Argulid is in itself an occurrence of some interest—so much the more so, however, since the West-Indian species, in such points as are most essential systematically (*i. e.* the structure of the mouth and legs), approaches the European *A. purpureus*, and forms with it (and perhaps also *A. giganteus*) a natural group (*Agenor*, Risso), reminding us, however, in the weaker development of the head-shield, of the common Argulid-type exemplified by the freshwater forms *A. foliaceus* (Linn.) and *A. coregoni*, Thor. As is the case in *A. purpureus*, the swimming-feet lack the “tassel” (*flagellum*); the mandibles are placed near the opening of the mouth, and the “lip” is open beneath. The intermediate joint or “patella,” found on the second pair of maxillipeds in *A. purpureus*, is wanting in *A. dactylopteri* as in *A. foliaceus* and other species. This species is especially remarkable for the great difference which exists between the sexes: in the other known Argulids such difference is principally displayed in the form of the posterior portion of the body or *tail*, and in a very slight degree affects the head-shield; in *A. dactylopteri* this part also is of an entirely different form in the two sexes.

The specimens which I have examined were twelve in number, and seem to have been about half the number actually found on the fish. Thus more than twenty of these parasites lived in the gill-cavity of this fish. Those examined are of very different sizes, from 4 to 8 millimetres long; only three of them

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† Thorell, ‘*Om tvenne Europeiska Argulider; jemte anmärkingar om Argulidernas morfologi och systematiska ställning, samt en öfversigt af de för närvarande kända arterna af denna familj*’ (translated, from the ‘*Öfvers. af K. Vet.-Akad. Förhandl.* 1864,’ pp. 7–72, in Nos. 105, 106, & 108 of this Journal).

are males, of which one, although only 5 millims. long, would seem to be almost full-grown; of the females, even the least ($4\frac{3}{4}$ millims. in length) contain some large and fully developed eggs.

Argulus (Agenor) dactylopteri, n. sp.

Scutum cephalicum antice utrinque sinuatum, postice late incisum, in ♀ inverse subovatum, latitudine paullo longius, pedes ultimi paris non tegens, in ♂ paullo minus, utrinque ante medium auriculato-productum; cauda parum profunde incisa, in ♀ subtriangula, paullo latior quam longior, angulis rotundatis, longit. circa $\frac{1}{3}$ reliqui corporis, laciniis apice rotundato-acuminatis, in ♂ oblongo-ovata, longit. circa $\frac{1}{3}$ totius corporis, laciniis acutioribus; stimulus mediocris, siphon subcylindratus; cotyledones parvi, diametro $\frac{1}{10}$ – $\frac{1}{8}$ longit. corporis æquantur; pecten elongato-productus, plaga magna scabra dentibusque tribus fortibus conicis, acuminatis; pedes flagello carent.—Long. ♀ 7–8, lat. 5 millim.; long. ♂ circa 5, lat. circa 3 millim.

Hab. in Mari Indicæ occidentalis, in cavitate branchiali *Dactylopteri volitantis*, (Linn.) inventus.

Descr. FEMINÆ. Scutum cephalicum supra modice convexum, inverse subovatum, latitudine paullo longius, in lateribus leviter rotundatum, amplum, usque ad basin pedum quarti paris pertinens, antice abrupte sinuato-angustatum, parte cephalica prominenti, antice rotundato-triangula, in dorso costis duabus chitinosus ut in reliquis distincta; postice late et sat profunde (ad $\frac{1}{3}$ longitudinis) incisum, laciniis intus subsinuatis, apice rotundatis, forma incisuræ subtriangula; supra læve, subtus versus margines antice dentibus minutissimis scabrum. *Truncus* latitudine circa $\frac{1}{3}$ scuti, segmentis latioribus quam longioribus, ultimo prioribus latiori, utrinque supra insertionem pedum quarti paris rotundato-dilatato, postice late et non profunde emarginato, basin caudæ tegenti. *Cauda* mediocris, $\frac{1}{3}$ longitudinis scuti æquans, $\frac{1}{4}$ totius corporis longit. vero paullo brevior, subtriangula, angulis rotundatis, latitudine paullo latior (in junioribus angustior), segmento ultimo trunci haud parum latior, antice bis sinuata, in lateribus leviter rotundata, postice parum profunde vix ultra $\frac{1}{3}$ longitudinis incisa, laciniis apice rotundato-acuminatis. *Appendices* minutissimæ: ex binis articulis constare videntur, primo brevi, subcylindrato, altero longiori, subovato, piloso.

Receptacula seminis a basi caudæ remota, ovata (longit. circa 0·9, lat. circa 0·55 millim.); a capsula seminis, quam includunt, canalis (filum?) longus, tenuissimus, convolutus, alium ejusmodi canalem excipiens, ad papillam prope basin caudæ sitam ductus est. *Ovarium* oblongum, per totum truncum extensum; ova perlucet sat magna (circa 1 millim. longa, $\frac{3}{4}$ millim. lata), 35 vel pauciora in exemplis, quæ vidimus.

Oculi oblongo-rotundati, obliqui, sat magni, diametro maxima circa $0.35 (= \frac{1}{2} \frac{1}{10}$ longit. corporis fere). *Macula ocellaris* parva, cum oculis triangulum fere æquilaterum formans.

Antennæ primi paris fere ad marginem capitis pertinent; art. 1^a brevis est, transversus, aculeo forti postice armatus; art. 2^a oblongus, priori 3-4-plo longior, versus apicem angustatus et in unicum fortem, incurvum productus, versus basin tuberculo forti, acuto, foras directo in margine antico, et unco forti in margine postico armatus; *appendix* ex articulis duobus constat: art. 1^a tenuis, angustus, æqualis, fere ad apicem antennæ pertinens; art. 2^a priori paulo angustior, plus duplo vero brevior, triplo longior quam latior, apice rotundato.

Antennæ secundi paris longitudine priorum, angustiores vero et inter se longius distantes, ad basin (art. 1^a et 2^a) crassæ, extus angustæ, subattenuatæ, articulis quinque. Art. 1^a diametro paulo longior, subcylindricus, basi postice unco armatus; art. 2^a eadem fere diametro, sed brevior est; art. 3^a longit. fere priorum 2 conjunctis, multo vero angustior, versus apicem subangustatus, diametro circa 4-plo longior; art. 4^a illo paulo angustior, et dimidio brevior; art. 5^a priori duplo fere brevior, pauloque angustior, diametro paulo longior. Pone basin antennarum adsunt *unci auxiliares* duo fortes, cum uncis art. 1ⁱ antennarum primi paris trapezium paulo latius quam longius formantes.

Stimulus mediocris est, vagina ad basin antennarum primi paris saltum pertinenti, verticula ad basin nulla.

Sipho sat parvus, versus apicem subangustatus, ipso apice oblique truncato et in dorso subincrassato; diametro circa triplo longior; subtus versus basin granulis vel dentibus minutissimis sparsus; porrectus inter basin maxillipedum secundi paris pertinet. Apex cucullo sive *labio* rotundato-subtriangulo, subtus aperto ut in *A. purpureo*, efficitur, cujus margo in medio emarginatus est et membrana tenuissima ibi auctus (?): intus pegmate ejusmodi, atque in *A. foliaceo* et *coregoni* descripsimus, fulcitur, instrumenta manducationis gerenti. *Maxillæ* parvæ, debiles, oblongæ, apice extus rotundatæ, intus rectæ, non dentatæ, callo chitinoso, transverso conjunctæ. *Mandibulæ* transverse positæ, certo situ in ipsa apertura oris apparentes, paulo profundius tamen quam in *A. purpureo* pertinentes: oblongæ sunt, basi latæ, tum angustatæ et paulo curvatæ, in ipso apice et versus apicem in margine concavo dentibus minutis acutis, densis, versus apicem in margine vero convexo dentibus tribus raris, ultimo forti, armatæ. Ante maxillas et mandibulas in fundo aperturæ oris dentes vel *apices* duo fortes sese ostendunt.

Cotyledones (maxillipedes primi paris) parvi; diameter maxima $\frac{1}{9} - \frac{1}{10}$ longit. totius corporis æquat et paulo major est quam spatium quo inter se et a margine scuti distant. Radios marginis circa 45 numeravi.

Maxillipedes secundi paris ex articulis 5 constant: art. 1^a crassus, diametro paulo longior, *pectine* quasi in manubrium elongatum, angustum, oblique intus et antrorsum directum producto, in margine postico dentibus tribus fortibus conicis acuminatis armato, quorum extimus reliquis fortior est, ante dentes vero plaga magna obliqua,

scabra prædito. Art. 2^s priori paullo brevior et angustior, versus apicem subangustatus, latitudine maxima vix longior, nulla "patella" auctus; art. 3^s eo duplo brevior est, multoque angustior, latitudine paullo longior; art. 4^s etiam paullo brevior et angustior; art. 5^s prioris longitudine et versus apicem paullo angustatus, subconicus, apice in digitum minutum producto et aculeo parvo armato. Inter et pone maxillipedes secundi paris adsunt *unci* quatuor sat fortes, trapezium formantes.

Pedes omnes flagello carent; extensi ad marginem scuti pertinent. Stipes ped. par. 1¹-3¹ ex tribus, paris 4¹ ex duobus articulis constat; rami versus apicem angustati sunt et in latere posteriore et in apice setis fortibus, plumatis vestiti. Ramus inferior pedum paris 3¹-4¹ ex articulis 2 constat, reliqui rami simplices sunt. Ramus superior inferiori paullo longior est, præsertim in pedibus anterioribus. Stipes pedum *primi* paris, a latere inferiore visus, reliquorum paullo longior est, art. 1^o brevissimo, transverso, art. 2^o dimidio fere longiore quam latiore, art. 3^o priore dimidio brevior, versus apicem angustato; ramus superior longior et crassior multo, quam ramus inferior. *Pedes secundi* paris prioribus paullo breviores; *pedes tertii* paris longitudine fere priorum, ramis subæqualibus: ramus inferior ex art. 2 constat, quorum 1^s latitudine circa duplo longior est, subcylindratus, 2^s eo fere duplo longior. *Pedes quarti* paris stipitem ex 2 tantum articulis constantem habent, art. 1^o transverso, in latere posteriore intus retro producto et rotundato et tum in processum magnum, subtriangulum, foras directum producto; art. 2^o illo fere duplo longiore, latitudine fere ut in pedibus anterioribus, ad apicem rotundato-angustato; ramus inferior stipite et ramo superiore brevior est, articulo 1^o versus apicem subangustato, duplo longiore quam latiore, art. 2^o eo paullo longiore.

MAs femina minor est (longit. circa 5 millim.) eique valde dissimilis, forma præsertim scuti et caudæ. *Scutum cephalicum*, quod minus est (longit. = circa $\frac{2}{3}$ longitudinis corporis), postice *pedes tertii* paris vix tegens, utrinque paullo ante medium in lobum productum est fere semicircularem, subtruncatum, antrorsum et foras directum, sinu profundo a parte cephalica separatum, et hoc modo ibi fere latius quam longius evadit; postice eodem modo atque in ♀ incisum est, laciniis modo magis parallelis, margine interiore vix sinuato. Pars cephalica major magisque prominens et truncata quam in ♀. *Truncus* multo angustior quam in ♀, latitudine fere 3-plo longior, segmentis transversis, gradatim paullo brevioribus, ultimo simplici, non dilatato. *Cauda* longitudine $\frac{3}{10}$ totius corporis longit. æquans, ovata, subacuminata, latitudine paullo plusquam dimidio longior, antice et in lateribus rotundata, postice non ad $\frac{1}{3}$ longitudinis incisa, laciniis apice subacuminatis; in ♂ juniore etiam angustior, laciniis acutioribus.

Testes longi sunt et angusti (1 millim. longi, lat. max. circa 0·2 millim.), a basi caudæ fere ad fundum incisuræ pertinentes. *Vesicula seminis* rotundato-ovata, sat parva (0·4 millim. longa, 0·3 millim. lata), in trunci segmento 1^o (et parte segmenti 2ⁱ) locata est; duo *ductus deferentes*, primum crassi, tum attenuati, ab extremitate ejus anteriore oriuntur, spatio vix ullo sejuncti: mox retro flexi et prope

latera vesicæ euntes pone eam paullo magis approximati paralleli ad segm. ultimum currunt. *Vasa efferentia* duo, a testibus inter ductus deferentes ad vesicam seminis ducta, vidisse videor, *glandulas accessorias* vero nullas.

Antennæ primi paris paullo ultra marginem scuti pertinent. *Pedes* quoque extensi ultra marginem scuti porriguntur. *Pedes* primi et secundi paris ut in ♀ fere sunt: tertii et quarti paris vero diversi, *instrumentis copulationis* instructi. *Stipes* pedum tertii paris art. 1^m transversum habet, postice in angulum obtusum productum; art. 2^s quoque transversus et parum longior est, postice eminentia (*capsula seminis*) magna, forma fere mammæ, ad apicem antice, supra, procurso forma fere digiti, antrorsum et foras directo præditus. Art. 3^s priori paullo longior est, ad basin illius fere crassitudine, versus apicem angustatus, diametro maxima parum longior. Rami ut in ♀ fere. In pedibus quarti paris art. 1^s stipitis transversus est, postice subdilatus, obliquus et bis rotundatus; art. 2^s crassus, oblongus, in apice et postice rotundatus, in latere anteriore *supra* prokursibus duobus conniventibus, obtusis, anteriore crassiore, *infra* vero dente armatus. Rami subæquales, inferior, ut in pedibus tertii paris, verticula paullo intra medium in duos articulos divisus.

Color (exemplorum in spiritu vini asservatorum) albicans, subpellucidus. In feminis dorsum trunci distinguitur vittis duabus ad longitudinem ductis violaceis, e maculis parvis ejusdem coloris formati, quæ vittæ ovarii sunt, per cutem dorsi perlucens.

[In a note appended to this paper, Prof. Thorell says, with regard to his species *A. coregoni*, that its range is not confined to Sweden. It is found in other parts of Europe, and has probably been confounded, by many of the older authors, with *A. foliaceus* (= *A. delphinus*, Müll.): this is the case, at least, with Hermann, who, in his 'Mémoire Aptérologique' (1804), p. 131, pl. 5. fig. 3, and pl. 6. fig. 11, describes and figures *A. coregoni* under the name of *A. delphinus*, although the synonyms (Müller's and Löfling's) which he cites refer to *A. foliaceus*.]

XII.—*Description of a new Genus of Diurnal Lepidoptera belonging to the Family Satyridæ.* By ARTHUR G. BUTLER, F.Z.S.

[Plate II.]

THE species which represents the present genus was described by Mr. Frederick Moore in his 'Catalogue of the Lepidopterous Insects in the Museum of the East India Company,' vol. i. p. 234. n. 503, as a species of *Mycalesis*?, for which he proposed the generic name of *Theope*.

Unfortunately this name had been previously used for a genus of Erycinidæ, which was characterized by Prof. Westwood at page 439 of 'The Genera of Diurnal Lepidoptera.'